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**PSYCHIATRIC MORBIDITY AND READINESS FOR CHANGE:
A STUDY OF METHAMPHETAMINE DEPENDENT SUBJECTS
IN CAPE TOWN**

BY

DR. TAIWO AKINDIPE

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SUPERVISORS

Prof. Dan Stein

FRCPC, PhD

Professor of Psychiatry,
University of Cape Town.

Dr. Don Wilson

FCPsych (SA), MB.ChB

Principal Consultant Psychiatrist,

Groote Schuur Hospital

And

Head of Addiction Psychiatry unit,

University of Cape Town.

DECLARATION

I, **Dr. Taiwo Akindipe** hereby declare that the work on which this thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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DEDICATION

To *Timilehin Akindipe* — of course

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LIST OF ABBREVIATIONS

SCID: Structured Clinical Interview for DSM-IV Disorders

MINI: Mini-International Neuropsychiatric Interview

IQR: Inter-quartile range

SD: Standard deviation

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ABSTRACT

Objectives: Methamphetamine users may suffer from a range of co-morbid psychiatric disorders. Predictors of treatment outcome in substance dependence may include both such co-morbidity and readiness for change. The nature of the relationship between psychiatric co-morbidity and readiness for change has not been systematically studied. Therefore, this study aimed to assess the prevalence and patterns of psychiatric disorders in individuals dependent on methamphetamine; determine whether there is a relationship between such co-morbidity and readiness for change; and identify factors associated with readiness for change in this group.

Methods: Sixty adult patients with a diagnosis of methamphetamine dependence and no co-morbid medical disorder were consecutively recruited from three drug rehabilitation centres. The Mini-International Neuropsychiatric Interview (MINI) was used to obtain the diagnosis of Methamphetamine dependence. Each volunteer completed a Socio-demographic Questionnaire and Severity of Dependence Scale (SDS). Psychiatric co-morbidity was evaluated using the Structured Clinical Interview for DSM-IV Axis I disorders (SCID), and Readiness for change (Motivation) was measured with SOCRATES 8D (Stages of Change Readiness and Treatment Eagerness Scale).

Results: Almost all (96.7%) the respondents were of the 'coloured' race, mostly males (71.7%) with more than half (55.0%) being 25-34 years of age. The prevalence of psychiatric co-morbidity was 38.3%. The most prevalent psychiatric disorders were mood disorders (18.3%), psychotic disorders (13.3%) and anxiety disorders (6.7%). More than half of the respondents (60%) were at the stage of *Taking steps*. Female gender and having religious affiliation were associated with increased *Recognition* of the drug problem ($p = 0.04$ and 0.002 respectively). Having alternative non-drug related leisure activities was associated with reduced ambivalence to change ($p = 0.002$). Also, treatment duration correlated negatively with *Ambivalence* ($p = 0.01$). An inverse relationship was observed between the duration of methamphetamine use and the stage of *Taking steps* ($p = 0.02$). Psychiatric co-morbidity adversely affected recognition of the drug problem ($p = 0.01$) but showed no associations with the other stages of change.

Conclusion: Psychiatric disorders are highly prevalent among individuals dependent on methamphetamine. These impair ability to recognise the drug problem but do not seem to affect the other stages of change. There is a need to review the current admission policy into rehabilitation centres and incorporate an integrated treatment approach addressing both substance use disorders and psychiatric co-morbidity for methamphetamine using population. Efforts aimed at management of leisure time and substitution with non-drug related activities may bolster readiness for change and eventual treatment outcome.

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CHAPTER ONE

INTRODUCTION

Six years after the initial reports of increase in Methamphetamine use in the Western Cape , data from treatment centres showed that methamphetamine was the most common primary substance of abuse in Cape Town (SACENDU, 2010). This increase in methamphetamine use contributed to increased demand and need for psychiatric intervention in the Province (Plüddemann et al, 2009).

Methamphetamine users do suffer from a range of psychiatric disorders (Glasner-Edwards et al, 2010; Zweben et al, 2004). The presence of such co-occurring psychiatric disorders may adversely affect their response to the treatment of substance use disorder. Data from the United States indicates that methamphetamine-dependent adults with psychiatric co-morbidity had poorer treatment and functional outcomes (Glasner-Edwards et al, 2010). However, there is relatively little data on co-morbidity in methamphetamine users from low and middle income countries.

While it is clear that co-morbidity impacts negatively on treatment outcomes, the mechanism underlying this relationship is unclear. One possibility is that co-morbidity impacts on readiness for change. Although readiness for change plays an important role in predicting outcomes (Joe et al, 1998), the relationship between **Co-morbidity** and **Readiness for change** has not been well studied to date.

Therefore, this study aims to assess the prevalence and patterns of co-morbid psychiatric disorders in a sample of methamphetamine users in a low to middle income country; determine whether there is a relationship between such co-morbidity

and readiness for change; and identify factors associated with readiness for change in this group of individuals.

CHAPTER TWO

LITERATURE REVIEW

2.1 METHAMPHETAMINE – AN OVERVIEW:

2.1.1 The ‘Drug’- Methamphetamine

Methamphetamine, a derivative of amphetamine, has more pronounced effects on the central nervous system than amphetamine (Yoshida, 1997). It possesses a methyl group which increases its lipid solubility and permeability of the blood-brain barrier (Kish, 2008; Cruickshank and Dyer, 2009). These physical properties lead potentially to increased potency and toxicity (Kish, 2008; Cruickshank and Dyer, 2009).

Unlike opioid or cocaine precursors, which can be grown only in regions with suitable climate and soil, amphetamine-group substances can be manufactured anywhere with access to the appropriate ingredients. The most common ingredients for methamphetamine production include ephedrine or pseudoephedrine (UNODC, 2009). Therefore, either phenylpropanolamine or phenylacetic acid can be used to synthesise amphetamine. The wide availability of these relatively inexpensive over-the-counter ingredients, coupled with the simple manufacturing process in clandestine laboratories, has probably contributed to the escalation of methamphetamine use worldwide.

2.1.2 Epidemiology of Methamphetamine Use

A growing area of concern has been the increasing trends of methamphetamine use globally. The 2009 World Drug Report suggests that the global prevalence of Methamphetamine use is second only to cannabis, with estimates suggesting that up

to 51 million individuals (1.2% of the global population aged 15-64 years) have used Methamphetamine at least once in the past 12 months (UNODC, 2009). Also, epidemiological data from several countries, including regions of East Asia and Pacific region (Farrell et al, 2002; UNODC, 2005), United States of America (Roehr, 2005), and South Africa (Parry et al, 2004) indicate that methamphetamine production, trafficking, and use are steadily increasing.

Methamphetamine abuse is a major problem in the Western Cape Province of South Africa, particularly the Cape Flats area in Cape Town (SACENDU, 2010). The annual prevalence of use among those aged 15–64 years was 0.6% in 2002 (UNODC, 2004). In the same year, the treatment for methamphetamine abuse in Western Cape accounted for less than 1 percent of all substance-related treatments. However by 2004, this had increased to 15 percent. A year later it was 30 percent, peaking at 41 percent in the first half of 2007 (Plüddemann et al, 2008b). A more recent study on drug abuse found that methamphetamine was the primary or secondary drug abused by 36 percent of all treatment-seeking patients and by 73 percent of patients younger than 20 years in Cape Town (Plüddemann et al, 2009; Plüddemann et al, 2008b). Thus, Cape Town is one of the cities with the sharpest increase in methamphetamine use in South Africa.

The white, odourless, bitter-tasting crystalline powder that comprises methamphetamine can be purchased at a relatively low cost (R15-R30 per 'straw') (Plüddemann et al, 2008a). The drug can be smoked, snorted, orally ingested or injected intravenously. In Cape Town, methamphetamine is smoked mainly in crystalline form and referred to as '**Tik**', due to the sound it makes when heated (a ticking or clicking/crackling sound). When in this crystalline form, methamphetamine

is especially potent and more likely to result in dependence than other forms of methamphetamine use (Topp et al, 2002).

2.1.3 Public health effects of Methamphetamine abuse

Methamphetamine abuse and its consequences have emerged as some of the most serious public health problems worldwide (SAMHSA, 2006). Its use is linked to the spread of HIV (Human Immunodeficiency Virus) and other sexually transmitted diseases, acute and chronic psychosis, road traffic accidents, violence, and family and social disruptions (Lee et al, 2007). In Cape Town, for example, students who use methamphetamine had an increased risk of contracting sexually transmitted infections (Plüddemann et al, 2008c), mental health problems and higher levels of aggressive behaviour (Plüddemann et al, 2010).

The public health consequences of methamphetamine abuse may be due to the physical and psychiatric effects of the drug. Methamphetamine abuse produces heightened libido, increased energy and impaired impulse control which can make individuals engage in sexual behaviours that carry risks for transmission of infectious diseases (Roll et al, 2009). Also, methamphetamine-associated feelings of enhanced well-being, impairments in cognition and impulse control can contribute to the occurrence of personal and vehicular accidents, leading to care-seeking at emergency departments (Roll et al, 2009). In addition, violent behaviours could emanate from the increased aggression and mental health problems experienced by this group of individuals.

Other health-related physical consequences of methamphetamine abuse include: seizures, cerebrovascular haemorrhage or spasm, memory loss, cardiomyopathy, dermatologic lesions, poor dentition and weight loss (Lee et al, 2007).

2.1.4 Burden on Mental Health System

Apart from physical health problems, methamphetamine use is associated with a range of psychiatric manifestations. Compared to other stimulants like cocaine, methamphetamine users in the United States are more likely to have a psychiatric diagnosis (Copeland and Sorenson, 2001).

Also, a recent American study of methamphetamine-related emergency room visits showed that mental health problems were the most common presentations associated with methamphetamine use (Hendrickson et al, 2008). These psychiatric symptoms can cause considerable morbidity and stretch resources of mental health facilities. For example, the demand and need for psychiatric intervention related to methamphetamine use was reported to be high in Cape Town (Plüddemann et al, 2009). Methamphetamine was found to be the most common primary substance of abuse in 59% of psychiatric admissions. This methamphetamine-related demand for mental health services in Cape Town may be far greater than can be measured by psychiatric admissions. Also, this may pose major challenges on provision of training and support to all health services dealing with these patients.

2.2 METHAMPHETAMINE USE AND PSYCHIATRIC CO-MORBIDITY:

2.2.1 Pattern of Psychiatric Co-morbidity

The most common psychiatric symptoms experienced by methamphetamine users include psychoses, depression and anxiety (Glasner-Edwards et al, 2010; Zweben et al, 2004). The severity of these symptoms may be related to the quantity and/or frequency of use, the route of administration, and individual differences in sensitivity to the drug (Harris and Batki, 2000).

Methamphetamine-induced psychotic symptoms, which may mimic those of schizophrenia, include paranoid ideation, delusions, as well as auditory and visual hallucinations. Psychotic symptoms occur transiently in a substantial proportion of methamphetamine users (McKetin et al, 2006) and, along with other psychiatric symptoms, typically subside within a week of abstinence (Newton et al, 2004). However, in a subset of users, psychosis may persist for several months or longer after sustained abstinence (Iwanami et al, 1994; Ujike and Sato, 2004).

As in the case of alcohol and cocaine, a review of articles did reveal that methamphetamine can cause depressive symptoms in active users, which may remit spontaneously early in abstinence or have a prolonged course (Meredith et al., 2005). Among a sample of methamphetamine users drawn from three sites in the United States, Glasner-Edwards et al (2009) found that depressive symptoms declined during the course of treatment in the overall sample, with greater reductions among those who abstained from methamphetamine during treatment relative to those who used. Abstainers shifted from clinically relevant symptom levels at baseline to the normal or minimal symptom range at discharge.

Similar to other psychoactive stimulants, methamphetamine can trigger manic episode in patients with pre-existing diagnosis or a predisposition to bipolar disorders (Chen et al, 2003).

Anxiety disorders have been reported among methamphetamine users (Zweben et al, 2004). Anxiety symptoms commonly emerge both during methamphetamine intoxication (Cruickshank and Dyer, 2009) and withdrawal (McGregor et al, 2005), although the extent to which such symptoms persist following cessation of methamphetamine use remains largely unknown. The observation of anxiety

symptomatology in methamphetamine users may be explained, in part, by activation of the sympathetic nervous system via alpha receptor stimulation, a putative methamphetamine-specific mechanism (Cruickshank and Dyer, 2009).

When intoxicated, users may become agitated or violent (Richards et al, 1999; Zweben et al, 2004) and nearly one-third of treatment-seeking users have reported a history of suicide attempts (Glasner-Edwards et al, 2008; Zweben et al, 2004).

2.2.2 Prevalence of Psychiatric Co-morbidity

Although psychiatric symptoms are frequently observed in methamphetamine users, little is known about the prevalence of psychiatric disorders among methamphetamine-dependent individuals in low and middle income countries. Syndromes such as methamphetamine psychosis (Sato, 1992) have received descriptive attention over the past decade, but the prevalence of this and other more frequently occurring disorders or sequelae (e.g. depression, anxiety disorder) in methamphetamine users have not often been rigorously studied.

A recent study of methamphetamine dependent subjects in the U.S found that 48.1% of the sample met criteria for a current or past psychiatric disorder (Glasner-Edwards et al, 2010). This rate was largely accounted for by mood disorders, anxiety disorders and antisocial personality. Although the study had a large sample size of 526, limitations include the use of MINI (Mini-International Neuropsychiatric Interview) in making definitive psychiatric diagnoses, as well as the exclusion of patients with psychiatric disorders severe enough to warrant primary treatment. The MINI does not distinguish substance-induced from primary psychiatric syndromes neither does it determine order of onset of substance use relative to psychiatric diagnoses. Also, the researchers' exclusion of subjects with psychiatric disorders

needing primary treatment could have resulted in underestimation of the prevalence rates of psychiatric diagnoses.

Among methamphetamine dependent individuals, a subset develops severe recurrent psychotic symptoms, commonly termed 'Methamphetamine psychosis'. These symptoms are often associated with high levels of psychiatric hospitalisation and serious social dysfunction (Chen et al., 2003). Several studies have examined the prevalence of methamphetamine psychosis and one study reported a lifetime prevalence of 27% (all substance-induced) based on the SCID (Shoptaw et al., 2003). Another study reported that 23% of their sample had symptoms of psychosis in the previous year, as measured by the Brief Psychiatric Rating Scale (McKetin et al., 2006). When subjects who had a history of non-drug-induced psychotic disorder were excluded, the past year prevalence was 18%. A more recent study however reported that 12.7% of their sample met criteria for a lifetime psychotic disorder (Glasner-Edwards et al., 2010).

Depressive disorders are more prevalent among methamphetamine users than in the general population (Glasner-Edwards et al, 2009). In a comparison of 46 methamphetamine users with 31 non-users, trends were observed for more symptoms of depression in the methamphetamine users (Nakama et al, 2008). Also, more than half (52%) of gay or bisexual men seeking treatment for methamphetamine abuse or dependence had mood disorders; 41% of these met criteria for substance-induced mood disorders (Shoptaw et al, 2003). Similarly, a study of 1580 arrestees found that those with Methamphetamine dependence were significantly more likely than other arrestees to report histories of depressive symptoms (Kalechstein et al, 2000). In this forensic setting, more women reported

the syndrome of depression; the findings remained statistically significant after controlling for demographic profile, HIV serostatus, and history of other substance dependence. Therefore, the use of methamphetamine can result in depressive symptoms not only in the aftermath of the use episode, but months thereafter (Zweben et al, 2004). It is however not clear if these depressive symptoms are part of 'Methamphetamine Withdrawal Syndrome' or constitute an independent entity.

Prevalence rates of anxiety disorders have been reported among methamphetamine using populations. These rates vary between studies. Hall et al (1996) found that over three quarters of amphetamine users reported anxiety symptoms. On the other hand, nearly 40% of treatment-seeking methamphetamine users in another study had history of anxiety disorders (McKetin et al, 2008). In a recent research, Salo et al (2010) reported 24.3% lifetime prevalence rate of anxiety disorders and 3.7% for methamphetamine-induced anxiety disorders among individuals dependent on methamphetamine. Similar to this, a 3-year follow-up study of methamphetamine dependent adults found that 26.2% of them met criteria for a current or past anxiety disorder (Glasner-Edwards et al, 2010b). Commonly reported anxiety disorders were generalised anxiety disorder, social anxiety disorder, post-traumatic stress disorder, panic disorder and agoraphobia. Those with anxiety disorders poorly adhered to treatment and had a higher frequency of methamphetamine use during the follow-up period (Glasner-Edwards et al, 2010b).

Although there is a consensus amongst studies about the presence of psychiatric disorders in Methamphetamine users, some of the studies that reported on prevalence rates have key limitations. Nakama et al (2008) had a small sample size of 46 made up of predominantly low socio-economic status individuals with low level

of education; evaluated based on self-reports. Low socio-economic status independent of substance abuse may be related to greater psychiatric symptoms. Also, substance users can be poor historians thereby bringing to question the validity of their psychiatric diagnoses.

The findings of another study by Semple et al (2007) might be difficult to generalise to all methamphetamine users as it focused only on females and lacked structured diagnostic instrument. Shoptaw et al (2003) on the other hand made use of the SCID, a structured diagnostic instrument but the study was carried out amongst gay and bisexual men.

A more robust, large sample sized ($n = 1580$) study of psychiatric morbidity amongst methamphetamine dependent individuals of both genders was carried out by Kalechstein et al (2000) in California. The sample was a forensic one consisting of arrestees in City and County jails who agreed to participate in the study. Also, premorbid psychopathology was not assessed, making it difficult to distinguish between methamphetamine-induced psychiatric symptoms and independent psychiatric symptoms. More also, standardised measures like the SCID was not used to assess for the presence of psychiatric disorders.

Despite the increasing trends of methamphetamine use in some parts of South Africa, there is paucity of research on prevalence of psychiatric co-morbidity among methamphetamine users in this part of the world. In fact, none of the studies discussed above emanated from Africa.

2.2.3 Psychiatric Co-morbidity and Treatment outcome of Substance use disorder

Psychiatric disorders may lead to drug dependence (Swadi, 1999). Conversely, the drug use may also result in psychiatric symptoms (Miller and Fine, 1997). When co-occurring psychiatric disorders are present, they may adversely affect the response to treatment of substance use disorders (Carroll et al, 1993).

A recent study of methamphetamine-dependent adults 3 years after treatment revealed that the presence of psychiatric co-morbidity was associated with poorer treatment and functional outcomes (Glasner-Edwards et al, 2010). Those with Axis I psychiatric disorders had increased methamphetamine use and greater functional impairment over time relative to those without psychiatric disorders.

Substance-dependent individuals with a co-morbid psychiatric disorder are more likely to relapse than individuals without a co-morbid psychiatric disorder (Brady et al, 1990; Carroll et al, 1993). The exact mechanism through which co-morbid psychiatric disorder affect treatment outcome is unclear. One potential mechanism is Readiness for Change.

2.3 READINESS FOR CHANGE:

Motivation or Readiness for Change refers to a central mechanism or constellation of mechanisms that lie at the heart of why and how people change addictive and health behaviours (Miller, 2006). Motivation is a critical determinant of an individual's performance and may influence the outcome of behaviour (Bandura, 1986; Miller, 1985). Although there are different theories about motivation (Miller, 1985; Miller, 2006), the concept broadly includes an individual's interest in the need for change,

his or her goals and intentions, the need to take responsibility and make a commitment to change, as well as sustaining the behaviour change (DiClemente et al., 2004; Miller and Rollnick, 2002).

These multiple motivational tasks and the broader phenomenon of intentional behaviour change have been described as the Stages of Change in the Trans-Theoretical Model (TTM) of behaviour change developed by Prochaska and DiClemente (1984).

The trans-theoretical model depicts a sequence of stages through which people progress as they initiate and maintain behaviour change. The first of these is termed **precontemplation**, a state of unawareness of a problem or need for change. As problem awareness increases, the person enters a state of ambivalence or **contemplation**, in which pros and cons are weighed (Miller and Rollnick, 2002). Over time, the decisional balance may tip in favour of change, as adverse consequences (cons) outweigh the perceived advantages of status quo (pros), a process paralleling the idea of bottoming out. In their original model, Prochaska and DiClemente (1984) termed this point of shifting balance the *determination* stage but subsequently deleted this stage and later reinstated it, reconceptualising this transitional period as a **preparation** phase (Prochaska and DiClemente, 1992; Prochaska et al, 1992). Next the person moves into an **action** stage in which efforts are made to change behaviour. If these initial efforts are successful, the **maintenance** stage involves relapse prevention (DiClemente et al., 2004), taking steps to protect against reversion to the prior behaviour pattern. Given that behaviour change is not perfectly maintained on the first try in most cases, a **relapse** stage was also described, from which the person may revert back to action or cycle

again through contemplation, determination-preparation, action, and maintenance in order to achieve lasting behaviour change.

Stage-specific tasks need to be accomplished well enough to support forward movement toward the successful establishment of new behaviour, and often, individuals need to recycle through the stages multiple times to accomplish this (DiClemente, 2003; DiClemente, 2005). The tasks of each of the stages play an important role in what has been described as readiness to change behaviour.

2.3.1 Drug use and Readiness for Change

The role of motivation in the modification of addictive behaviours and the eventual recovery process has been studied. Findings from the studies demonstrate a positive correlation between motivation for change and substance abuse treatment outcomes (De Leon et al., 1994; Simpson and Joe, 1993). Motivation to change substance abuse behaviour has been associated with treatment engagement, quit attempts, treatment retention, sustained abstinence, and better treatment outcomes among individuals diagnosed with alcohol and cocaine dependence (Joe et al., 1998; Pantalon et al., 2002 and Stotts et al., 2001).

Although readiness for change has been widely reported as predictive of treatment outcome of alcohol and drug dependence, Project MATCH (1998) in the United States did not find this association among in-patient alcohol dependent samples. In Project MATCH, baseline readiness scores were more predictive when assessed in the outpatient arm compared to the inpatient arm of the trial. It did appear that the evaluation of motivation and stage of change was more difficult to obtain when patients were in protected environments, where abstinence was supported by the setting, restriction and lack of access to the substance of abuse.

Nonetheless, Motivational enhancement interventions have often produced improved outcomes compared with control conditions in a range of alcohol- and drug-abusing patients (Miller and Rollnick, 2002; Stotts et al., 2001). Therefore, it may be possible for a physician to increase motivation (e.g., through Motivational Enhancement Therapy) and thus help a patient move from an early stage of change (e.g. contemplation) to a more active and healthy stage (e.g. action).

Research has shown that several factors predict the stage of change and readiness for change in substance-using population. DiClemente et al (2009) reported that age and gender predicted readiness for change among alcohol dependent people. Other factors, like longer past abstinence and presence of psychiatric co-morbidity were reported as predictors of readiness to quit tobacco smoking (Martin et al, 2006; Unrod et al, 2004).

There are many ways to evaluate readiness for change. These range from a readiness ruler (e.g., on a scale of 1 to 10, how ready are you to change this behaviour [quit smoking, stop using illegal drugs]?), to more complex multiple-subscale measures (DiClemente et al., 2004). These multiple-subscale measures, like the University of Rhode Island Change Assessment (URICA) and the Stage of Change, Readiness, and Treatment Eagerness Scale (SOCRATES), have been used most often with alcohol- and drug-abusing individuals because they are sensitive to various types of attitudes and intentions and less vulnerable to social desirability or simple denial of a problem. However, these types of measures rely only on self-reports.

2.3. Readiness for Change and Psychiatric Co-morbidity

Readiness for change in a drug dependent patient might be affected by the presence of co-morbid psychiatric disorder. In a study of nicotine dependent individuals with co-morbid psychiatric disorder, for example, it was found that smokers with dual diagnoses (i.e., substance abuse and other psychiatric diagnoses) differ from smokers without psychiatric co-morbidity in their level of knowledge of the hazards of smoking and the benefits of quitting, and their reported readiness to change (Carosella et al, 1999). However, a recent critical review of the literature showed that psychiatric co-morbidity is not a consistent predictor of motivation to quit smoking (Heffner et al, 2007).

Among Methamphetamine-dependent patients, there is a paucity of data on the relationship between readiness for change and presence of co-morbid psychiatric disorders. Is readiness for change affected by some psychiatric conditions?

2.4 RELEVANCE OF THE STUDY:

Little is known about the pattern and prevalence of psychiatric co-morbidity among methamphetamine using population in Cape Town. This is in spite of reported increase in methamphetamine-related psychiatric hospitalisations in the Town. An understanding of the relationship between this psychiatric morbidity and important predictors of treatment outcome like Readiness for change is needed for adequate treatment of this category of people.

This study therefore seeks to fill the knowledge gap in a developing country like South Africa where such has not been investigated. It is hoped that the emergent

findings from the study will be useful in answering the question of the magnitude of psychiatric issues faced by individuals dependent on methamphetamine.

By addressing the relationship between psychiatric co-morbidity and readiness for change, this study will help inform an evidence-based framework for the practice of addiction psychiatry.

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CHAPTER THREE

AIMS AND OBJECTIVES

3.1 GENERAL AIM:

To determine the relationship between psychiatric co-morbidity and readiness for change (motivation) among individuals dependent on methamphetamine in Cape Town.

3.2 SPECIFIC OBJECTIVES:

1. To find the prevalence and patterns of psychiatric disorders among the study population.
2. To identify the factors associated with readiness for change.

CHAPTER FOUR

METHODOLOGY

4.1 Study Design:

This is a descriptive cross-sectional study carried out over a period of four months.

4.2 Study Locations:

The study was conducted at the Methamphetamine Clinic of J- block Psychiatry outpatient unit in Groote Schuur Hospital and two drug rehabilitation centres in Cape Town. Referrals came from a third drug rehabilitation centre to the methamphetamine clinic. This clinic provides follow-up psychiatric services for patients with methamphetamine-related disorders.

4.3 Study Population:

The study sample was drawn from among all the clients attending two out-patient and one in-patient drug rehabilitation centres in Cape Town.

4.4 Sample Selection:

a. Inclusion criteria:

- i) Participants aged 18 years and above.
- ii) Diagnosis of Methamphetamine dependence on the Mini-International Neuropsychiatric Interview (MINI).

b. Exclusion criteria:

- i) Dependence on other substances apart from nicotine.

- ii) Self-reported diagnoses of chronic medical disorders (such as cardiac, renal, hepatic, cerebrovascular, pulmonary or infectious diseases including HIV).
- iii) Inability to give informed consent.

4.5 Sample size:

A total of 60 consecutive participants who consented were recruited for this study.

4.6 Recruitment and Enrolment:

Participants were recruited from two out-patient and one in-patient drug rehabilitation centres in Cape Town. The researcher paid initial visits to these centres and held meetings with the counsellors. These meetings were used to disseminate information about the study, explain inclusion and exclusion criteria and secure the co-operation of the counsellors. Handbills and posters advertising the most important features of the study were placed in these centres. Each centre was given a notebook which was used by interested clients to enter their names and contact details.

Follow-up visits were made to these centres. During such visits, interested clients were seen individually to explain more about the study, screen for methamphetamine dependence; rule out exclusion criteria and obtain written informed consent.

Clients eligible for the study and willing to come to Groote Schuur hospital on their own were given referral to the Methamphetamine Clinic with an appointment date for evaluation. For those with transportation problems, an appointment was set up with the help of their counsellors for them to have the research evaluation done at their

respective centres. These appointments did not interfere with the clients' therapeutic sessions.

Volunteers who transported themselves to the Methamphetamine clinic were given food vouchers each at the end of the evaluation. All the participants from the in-patient drug rehab had their evaluations at the rehabilitation centre.

4.7 Instruments:

1. Mini-International Neuropsychiatric Interview (MINI): The MINI is a short diagnostic structured interview, developed by psychiatrists for DSM-IV and ICD-10 psychiatric disorders. It has similar reliability and validity properties as the Structured Clinical Interview for DSM-III-R patient (SCID-P) and the Composite International Diagnostic Interview (CIDI) (Sheehan et al, 1997). Among patients of psychiatric facilities in Florida and Paris, previously reported sensitivity was 0.70; specificities, negative predictive values and efficiency scores were 0.85 or higher across all the diagnoses (Sheehan et al, 1997).

With an administration time of approximately 15 minutes, it was designed to meet the need for a short but accurate structured psychiatric interview for multicenter clinical trials and epidemiology studies and to be used as a first step in outcome tracking in non-research clinical settings.

Modules I and J of the sixth version of the MINI which evaluates Alcohol dependence and Substance dependence respectively were used to screen volunteers for methamphetamine dependence in this study.

2. Socio-demographic Questionnaire: This was designed by the researcher to gather important socio-demographic characteristics of the participants; methamphetamine use history, previous psychiatric history and leisure time activities. It is made up of four sections.

The terms 'black', 'white' and 'coloured' in Question 3 of this Questionnaire were used given their historical significance in the South African context. Although they do not signify inherent characteristics, these demographic markers continue to predict local health disparities. The terms refer to people of African, European and mixed (African, European and/or Asian) ancestry respectively.

3. Severity of Dependence Scale (SDS): The Severity of Dependence Scale (SDS) is a short, five-item scale which can be used to measure degree of dependence upon different drugs (Gossop et al, 1995; Gossop et al, 1997). Each of the items is scored on a four-point scale (0, never/almost never; 1, sometimes; 2, often; 3, always/nearly always for items 1-4; and 0, not difficult; 1, quite difficult; 2, very difficult; 3, impossible for item 5). A total SDS score can be obtained by addition of scores for all items with higher total scores indicating higher levels of dependence.

Among samples of drug users in London and Sydney, the test-retest reliability for the total SDS scores (an aggregation of the five-item scores) was found to be 0.89 (Gossop et al, 1995). This indicates that the SDS has good retest reliability and, in this respect, provides a reliable measure of dependence.

The SDS is easy to understand. It can be completed by most drug users in less than a minute, and it has proved to be a useful research tool. Though yet to be validated in South Africa, the scale has been adapted for 'Tik' users locally.

4. Structured Clinical Interview for DSM-IV-TR Axis I Disorders (SCID-I): The SCID-I (First et al, 2002) is a semi-structured interview for making the major DSM-IV Axis I diagnoses. It has two versions: Clinician and Research versions. The research version of the SCID is much longer than the Clinician Version because it contains more disorders, subtypes, severity and course specifiers, as well as provisions for coding the specific details of past mood episodes. It is designed to include most of the information that is diagnostically useful to researchers. Two standard editions of the research version of the SCID-I are available: the Patient Edition (SCID-I/P) and the Non-patient Edition (SCID-I/NP). While The SCID-Patient Edition is designed for use with subjects who are identified as psychiatric patients, the SCID-I/NP (Non-patient Edition) is for use in studies in which the subjects are not identified as psychiatric patients (e.g. community surveys, family studies, research in primary care). For settings in which psychotic disorders are expected to be rare (e.g. an outpatient anxiety clinic) or for studies in which patients with psychotic disorders are being screened out, an abridged edition of the Patient Edition (SCID-I/P W/ PSYCHOTIC SCREEN) is available.

In the current study, the SCID-I served as the primary means of making the diagnoses of Psychiatric disorders. This is made up of a Summary Score Sheet, an Overview and modules A to J. These modules cover Mood Episodes, Psychotic and Associated Symptoms, Psychotic Disorders, Mood Disorders, Substance Use Disorders, Anxiety Disorders, Somatoform Disorders, Eating Disorders, Adjustment Disorder and an Optional Module respectively.

5. Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES)

The SOCRATES (Miller and Tonigan, 1996) is a self-report Readiness to change assessment instrument created specifically for alcohol and substance use. There are two versions of the scale: an alcohol version (SOCRATES 8A) and a drug version (SOCRATES 8D). The versions are identical except that words such as “drinking” on the alcohol version of the scale are replaced with “drug use” on the drug use version.

The present study used SOCRATES 8D, which is designed specifically for drug-using populations. It consists of 19 items, each of which is scored on a five-point Likert scale (e.g., 1 = No! Strongly Disagree; 5 = Yes! Strongly Agree). The item scores yield three subscales: Recognition, Taking Steps, and Ambivalence. Recognition comprises seven items (score range: 7–35) regarding acknowledgement of a drug-related problem and desire for change. Ambivalence comprises four items (score range: 4–20) and measures perceived control over drug use and drug problems. Taking steps comprises eight items (score range: 8–40) which measure the extent to which individuals are making positive efforts to change their drug-using behaviour. In the current study, the stage of change by each respondent was determined by using the subscale with the highest score.

Psychometric analysis of the SOCRATES within a group of substance dependent military service members in the United States showed that the instrument has good internal consistency (alphas were: 0.93 for Recognition, 0.84 for Taking Steps, and 0.71 for Ambivalence) (Mitchell et al, 2005).

4.8 Research Procedures:

This study consisted of two stages. The first stage involved the screening of volunteers with the I and J modules of the MINI to ascertain their eligibility for the study. This screening was done as one-on-one brief clinical interview by the researcher and lasted for 10 minutes on the average. Volunteers who met the inclusion criteria were taken through the process of informed consent and given appointment for the second stage of the study within one week of the initial screening.

During the second stage, all the study instruments (Socio-demographic Questionnaire, SDS, SCID-I and SOCRATES 8D) were administered on a single day. Participants self-administered SDS and SOCRATES 8D while the researcher administered the Socio-demographic Questionnaire and SCID to them. All study instruments were administered in English language.

4.9 Beneficence and Maleficence:

This research was part of a bigger study which received ethical approval from the Health Sciences Faculty Research Ethics Committee (HREC REF: 340/2009). The study was conducted in accordance with the guidelines of The Declaration of Helsinki (WMA, 2008) and the South African Medical Research Council on the ethical conduct of research in humans (2008). These guidelines were strictly adhered to during and after the study.

Written informed consent was obtained from all participants. The volunteers participated willingly as they were made to understand that they could withdraw from the study at any point without offering any explanations.

Data collection, analysis and presentation were done without compromising confidentiality.

Subjects found to have psychiatric co-morbidity were given the option of continuing psychiatric care at the methamphetamine clinic or referred to an appropriate psychiatric facility.

4.10 Data Analysis:

The variables for analysis were coded for easy data entry. Data entry and analysis were done using the 19th version of the Statistical Package for Social Sciences (SPSS, 2011). A frequency distribution of all variables was carried out as part of data exploration and cleaning.

Assumption of normality was tested using the Shapiro-Wilk's test. Descriptive statistics such as means, medians, inter-quartile range (IQR), frequencies and proportions were used to summarize variables.

Independent variables include socio-demographic and drug use parameters; the main outcome measures (dependent variables) were psychiatric co-morbidity and readiness for change.

The quantity of 'Tik' was converted to grams. The conversion was done through a focus-group discussion with respondents who had sold methamphetamine before entering treatment (e.g five R30 'straw'/'pack' of 'Tik' equals one gram).

Readiness for change was recorded in two forms: 'Stage of change' and 'Level of Readiness for change'. The stage of change for each respondent was determined using the guidelines provided by the SOCRATES manual for interpretation of scores.

These stages of change (i.e Recognition, Ambivalence and Taking steps) were used to identify the level of Readiness for change. There were 2 categories: “High readiness for change” and “Low readiness for change”. The “High readiness for change” category is made up of respondents at the stage of ‘Taking steps’. All the respondents at the stages of ‘Recognition’ and ‘Ambivalence’ were grouped together into the “Low readiness for change” category.

Relationship between each of the SOCRATES stages of change (Recognition, Ambivalence and Taking Steps) and independent variables were explored using T-test. Analysis of Variance (ANOVA) was used to compare the mean scores of variables with more than two groups. Where significant difference was detected by ANOVA, this was subjected to Post hoc test to identify between group differences. Also, the mean score of each stage of change was compared between respondents with psychiatric co-morbidity and those without psychiatric co-morbidity.

In addition, bivariate associations between outcomes psychiatric co-morbidity and categorical variables were tested using the Chi-square (X^2) test. Fisher’s exact test was used whenever the expected count was less than five in more than 25% of the cells in cross-tabulations. Factors found to be significant in the unadjusted associations [Chi-square or Fisher’s] were entered into a multiple logistic regression [multivariate] analysis to identify factors independently associated with psychiatric co-morbidity.

Spearman’s correlation coefficient test was used as a measure of correlation between the stages of readiness for change and important socio-demographic/drug-use variables.

A confidence interval of 95% which allows for 5% sampling error, at significance level (p) less than or equal to 0.05 was used.

CHAPTER FIVE

RESULTS

5.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Table 1 shows the Social-demographic characteristics of the respondents.

Nearly all the respondents (96.7%) were of the 'coloured' race and unemployed (90.0%). Most left school in grades 7-11 (71.6%); not completing the matric class.

There were more males than females (71.7% vs 28.3%). The age range of the respondents was 18 to 44 years with a median of 26.00 (Inter-quartile range: 22-30).

The mean score of the Severity of dependence scale was 10.08 (SD:2.95).

Table 1: Socio-demographic Characteristics

Variables	Frequency (n=60)	Percentage (%)
Gender		
Female	17	28.3
Male	43	71.7
Age (years)		
<25	20	33.3
25-34	33	55.0
>35	7	11.7
Race		
Black	0	0.0
White	2	3.3
Coloured	58	96.7
Religion		
None	3	5.0
Christianity	40	66.7
Islam	17	28.3
Marital status		
Single	45	75.0
Married/Cohabiting	15	25.0

Have Children		
No	26	43.3
Yes	34	56.7
Highest Education		
≤ Grade 6	1	1.7
Grade 7- 11	43	71.6
Matric	12	20.0
Part Graduate	4	6.7
(Professional school)		
Complete Graduate	0	0.0
(Professional school)		
Employment status		
Unemployed	54	90.0
Employed	6	10.0

5.2 DRUG USE, METHAMPHETAMINE TREATMENT AND ABSTINENCE

As shown in Tables 2-5, Cannabis was the earliest drug of abuse in two-thirds (66.7%) of the respondents. The median age of first ever drug use was 16 years (IQR: 13 -18). About four out of every five respondents (81.7%) used one or more grams of methamphetamine per week. The mean duration of methamphetamine use was 6.58 years (SD=2.73). About a quarter of respondents (26.7%) had been previously treated for methamphetamine dependence. Only 40.0% had maintained voluntary abstinence for 6 months or more.

Table 2: General drug use

Variables	Frequency (n=60)	Percentage (%)
Age (years) at first ever drug use		
<20	49	81.7
≥20	11	18.3
First ever drug		
Cannabis	40	66.7
Methamphetamine	11	18.3
LSD	1	1.7
Ecstasy	4	6.7
Cocaine	2	3.3
Mandrax	2	3.3

Table 3: Methamphetamine use

Variables	Frequency (n=60)	Percentage (%)
Duration of use (years)		
≤3	8	13.3
>3	52	86.7
Average weekly quantity (gram)		
< 1	11	18.3
≥1	49	81.7
Pattern of use		
Twice a week/Weekends	9	15.0
>Twice a week	17	28.3
Daily	34	56.7

Table 4: Methamphetamine Treatment and Abstinence

Variables	Frequency (n=60)	Percentage (%)
Current Treatment		
In-patient Rehab	29	48.3
Out-patient Rehab	30	51.7
Treatment duration (weeks)		
< 1	6	10.0
1 - 4	35	58.3
> 4	19	31.7
Treatment reason		
Voluntary	54	90.0
Compelled/Mandated	6	10.0
Past Treatment		
No	44	73.3
Yes	16	26.7
Number of Past Treatments	n₁ = 16	% of total (n=60)
1	5	8.3
> 1	11	18.4
Type of Past Treatments	n₁ = 16	% of total (n=60)
In-patient only	3	5.0
Out-patient only	6	10.0
Both in and out-patient	7	11.7
Longest Treatment related abstinence (months)	n₁ = 16	% of total (n=60)
< 6	11	18.4
≥ 6	5	8.3
Longest Voluntary abstinence (months)	n = 60	%
Never	4	6.7
< 6	32	57.3
≥ 6	24	40.0

n₁ = Respondents previously treated for methamphetamine dependence

Table 5: Social Activities

Variables	Frequency (n=60)	Percentage (%)
Leisure activities		
Drug related	15	25.0
Non Drug related	45	75.0
Leisure company		
Alone	11	18.3
Family/Friends	49	81.7

5.3 PAST PSYCHIATRIC HISTORY AND CURRENT PSYCHIATRIC COMORBIDITY

Of the eleven respondents who had a previous personal history of psychiatric disorder, more than half (63.6%) of these were temporally later than methamphetamine use.

Current psychiatric co-morbidity was found in 38.3% of all respondents. The most common were mood disorders (18.3%), psychotic disorders (13.3%) and anxiety disorders (6.7%). Bipolar disorder Not Otherwise Specified (Intermittent hypomanic episodes) was the most common mood disorder while Paranoid schizophrenia dominated the psychotic disorder spectrum (See Tables 6 and 7).

Table 6: Previous Psychiatric History

Variables	Frequency (n=60)	Percentage (%)
Family History		
No	53	88.3
Yes	7	11.7
Personal History		
No	49	81.7
Yes	11	18.3
Onset of Personal History	n₂ = 11	% of n₂
Before Meth use	4	36.4
After Meth use	7	63.6

n₂ = Respondents with previous psychiatric history.

Table 7: Current Psychiatric Co-morbidity

Variables	Frequency (n=60)	Percentage (%)
Psychiatric Co-morbidity		
No	37	61.7
Yes	23	38.3
Number of Psychiatric disorders	n₃ = 23	% of total (n=60)
One	17	28.3
Two or more	6	10.0
Pattern of Psychiatric disorders	n₃ = 23	% of total (n=60)
Mood disorders	11	18.3
Psychotic disorders	8	13.3
Anxiety disorders	4	6.7

Type of Psychiatric disorders	n₃ = 23	% of total (n=60)
Mood disorders		
Bipolar NOS (Mixed episode)	1	1.7
Bipolar NOS (Intermittent Hypomanic episodes)	6	10.0
Bipolar mood disorder	2	3.3
SIMD(depressive features)	2	3.3
Psychotic disorders		
Psychotic disorder NOS(Persistent auditory hallucinations)	1	1.7
Schizophreniform disorder	1	1.7
Paranoid Schizophrenia	4	6.7
Substance induced Brief Psychotic disorder	2	3.3
Anxiety disorders		
PTSD	1	1.7
Panic disorder (with Agoraphobia)	1	1.7
Panic disorder (without Agoraphobia)	1	1.7
Specific Phobia (Heights)	1	1.7

n₃ = Respondents with psychiatric co-morbidity.

Bipolar NOS = Bipolar disorder Not otherwise specified

SIMD = Substance Induced mood disorder

Psychotic disorder NOS = Psychotic disorder Not otherwise specified

PTSD = Posttraumatic Stress Disorder

5.4 CURRENT PSYCHIATRIC CO-MORBIDITY AND READINESS FOR CHANGE

Sixty percent of the respondents were at the stage of Taking Steps. Respondents with psychiatric co-morbidity were no less likely to be at this stage of change. However, respondents with psychiatric co-morbidity had significantly lower scores on the dimension of 'Recognition' compared to those without psychiatric co-morbidity ($p=0.01$). The difference in level of change with respect to current psychiatric co-morbidity was not statistically significant ($p>0.05$). (Tables 8, 9A and 9B)

Table 8: Readiness for change

Variables	Frequency (n=60)	Percentage (%)
Stage of Readiness for change		
Recognition	2	3.3
Ambivalence	22	36.7
Taking steps	36	60.0
Level of Readiness for change		
Low	24	40.0
High	36	60.0

Table 9A: Psychiatric Co-morbidity and Readiness for change

Variables	No Psyc. comorbid (n = 37)		Psyc.comorbid (n = 23)		χ^2	df	p-value
	Frequency	%	Frequency	%			
Stage of Readiness for change							0.72 ^f
Recognition	2	5.4	0	0.0			
Ambivalence	13	35.1	9	39.1			
Taking steps	22	59.5	14	60.9			
Level of Readiness for change					0.01	1	0.91
Low	15	40.5	9	39.1			
High	22	59.5	14	60.9			

f= Fisher's exact test

χ^2 = Chi-square.

df = degree of freedom

Table 9B: Psychiatric Co-morbidity and Stage of Readiness

Variables	No Psyc. comorbid (n = 37)	Psyc.comorbid (n = 23)	t	df	p-value
	Mean Score	Mean Score			
Stage of Readiness for change:					
Recognition	31.54	28.57	2.64	58	0.01
Ambivalence	15.81	16.00	-0.27	58	0.79
Taking steps	35.30	34.70	0.55	58	0.59

t= t- test

5.5 FACTORS INDEPENDENTLY ASSOCIATED WITH CURRENT PSYCHIATRIC CO-MORBIDITY

Gender, family history of psychiatric disorder and previous personal history of psychiatric disorder had a significant association with current psychiatric co-morbidity ($p < 0.05$) (Tables 10-14). However, after controlling for the effects of the other variables, the factors independently associated with current psychiatric morbidity include gender, previous personal history of psychiatric disorder and age. Being a male was a risk factor for psychiatric co-morbidity (odds ratio = 7.91, CI = 1.09-57.01, $p = 0.04$). Also, having previous psychiatric history increased the risk of current psychiatric co-morbidity among the respondents (odds ratio = 18.50, CI = 2.64-129.87, $p = 0.003$). The risk of psychiatric co-morbidity increases as age decreases (odds ratio = 0.84, CI = 0.71-0.99, $p = 0.03$). (Table 15)

Table 10: Psychiatric Co-morbidity and Socio-demographic Characteristics

Variables	No Psyc. comorbid (n = 37)		Psyc.comorbid (n = 23)		X ²	df	p-value
	Frequency	%	Frequency	%			
Gender							0.04
Female	14	37.8	3	13.0	4.29	1	
Male	23	62.2	20	87.0			
Age (years)							0.06 ^f
<25	10	27.0	10	43.5			
25-34	20	54.1	13	56.5			
>35	7	18.9	0	0.0			
Race							0.14 ^f
White	0	0.0	2	8.7			
Coloured	37	100.0	21	91.3			
Religion							0.21 ^f
None	1	2.7	2	8.7			
Christianity	23	62.2	17	73.9			
Islam	13	35.1	4	17.4			
Marital status							0.09
Single	25	67.6	20	87.0	2.84	1	
Married/Cohabiting	12	32.4	3	13.0			
Highest Education							0.94
Below Matric	27	73.0	17	73.9	0.01	1	
Matric and above	10	27.0	6	36.1			
Employment status							0.19 ^f
Unemployed	35	94.6	19	82.6			
Employed	2	5.4	4	17.4			

f= Fisher's exact test

Table 11: Psychiatric Co-morbidity and Methamphetamine use

Variables	No Psyc. comorbid (n = 37)		Psyc.comorbid (n = 23)		χ^2	df	p-value
	Frequency	%	Frequency	%			
Duration of use (years)							
≤3	3	8.1	5	21.7			0.24 ^f
>3	34	91.9	18	73.3			
Average weekly quantity (gram)							
< 1	5	13.5	6	26.1	1.50	1	0.22
≥1	32	86.5	17	73.9			
Pattern of use							
Twice a week or Weekends	7	18.9	2	8.7	1.54	2	0.46
>Twice a week	11	29.7	6	26.1			
Daily	19	51.4	15	65.2			

f= Fisher's exact test

Table 12: Psychiatric Co-morbidity and Methamphetamine Treatment/Abstinence

Variables	No Psyc. comorbid (n = 37)		Psyc.comorbid (n = 23)		χ^2	df	p-value
	Frequency	%	Frequency	%			
Current Treatment							
In-patient Rehab	17	45.9	12	52.2	0.22	1	0.64
Out-patient Rehab	20	54.1	11	47.8			
Treatment duration (weeks)							
< 1	2	5.4	4	17.4			0.14 ^f
1 - 4	25	67.6	10	43.5			
> 4	10	27.0	9	39.1			
Treatment reason							
Voluntary	34	91.9	20	87.0			0.67 ^f
Compelled/Mandated	3	8.1	3	13.0			
Past Treatment							
No	28	75.7	16	69.6	0.27	1	0.60
Yes	9	24.3	7	30.4			
Longest Voluntary abstinence(months)							
Never	3	8.2	1	4.3			0.44 ^f
< 6	17	45.9	15	65.2			
≥ 6	17	45.9	7	30.4			

f= Fisher's exact test

Table 13: Psychiatric co-morbidity and Social Activities

Variables	No Psyc. comorbid (n = 37)		Psyc.comorbid (n = 23)		χ^2	df	p-value
	Frequency	%	Frequency	%			
Leisure activities							
Drug related	8	21.6	7	30.4	0.59	1	0.44
Non Drug related	29	78.4	16	69.6			
Leisure company							
Alone	6	16.2	5	21.7	0.29	1	0.59
Family/Friends	31	83.8	18	78.3			

Table 14: Psychiatric Co-morbidity (Current) and Psychiatric History

Variables	No Psyc. comorbid (n = 37)		Psyc.comorbid (n = 23)		χ^2	df	p-value
	Frequency	%	Frequency	%			
Family History							
No	36	97.3	17	73.9			0.01^f
Yes	1	2.7	16	26.1			
Personal History							
No	35	94.6	14	60.9	10.77	1	0.001
Yes	2	5.4	9	39.1			

f= Fisher's exact t

Table 15: Adjusted logistic regression analyses of variables associated with Psychiatric Co-morbidity

Variables	Beta	Wald	P-value.	Odds ratio	95% C.I.for Odds ratio	
					Lower	Upper
Gender						
Female				1.000		
Male	2.068	4.214	0.040*	7.912	1.098	57.013
Age	-0.176	4.544	0.033*	0.839	0.713	0.986
Family History of Psychiatric disorder						
No				1.000		
Yes	1.902	2.467	0.116	6.701	0.624	71.941
Personal History of Psychiatric disorder						
No				1.000		
Yes	2.918	8.611	0.003*	18.499	2.635	129.869
Severity of dependence score	-0.115	0.883	0.347	0.892	0.702	1.133
Constant	2.884	1.335	0.248	17.892		

*= p-value is significant

Age is modelled in logistic regression as it is an important health variable with a demonstrable trend (p = 0.06) on Chi-square test.

5.6 FACTORS ASSOCIATED WITH READINESS FOR CHANGE

5.6.1 The Stage of Recognition

As depicted in Table 16, females had significantly higher recognition scores compared to males ($p = 0.04$). Also, difference in mean recognition scores with respect to religious affiliation was statistically significant ($p = 0.02$). Respondents with religious affiliation had better recognition of the drug problem in comparison to those with no religious affiliation. Post hoc analysis showed that those without religious affiliation had significantly lower scores compared to either Christians or Muslims ($p < 0.05$).

Another important variable found to be significantly associated with recognition is previous psychiatric history. Having a previous personal psychiatric history was associated with significantly lower recognition score ($p = 0.02$). (See Table 20)

5.6.2 The Stage of Ambivalence

The nature of respondents' leisure activities was the only factor which showed significant association with Ambivalence to change. Table 19 showed that respondents with drug related leisure activities had significantly higher ambivalence scores than those with non-drug related activities ($p = 0.002$).

5.6.3 The Stage of Taking steps

As shown in Table 16, respondents with below matric educational level had significantly higher scores on Taking steps ($p = 0.02$).

Also notable is the trend for higher 'Taking steps' score by respondents with non-drug related leisure activities ($p = 0.08$) (see Table 19).

Table 16: Readiness for change and Socio-demographic Characteristics

Variables	Recognition		Ambivalence		Taking Steps	
	Mean Score	P value	Mean Score	P value	Mean Score	P value
Gender Male Female	29.79 31.94	0.04	16.00 15.59	0.58	35.02 35.18	0.90
Age (years) <25 25-34 >35	31.90 29.33 31.14	0.11 ^F	16.10 15.82 15.88	0.88 ^F	35.90 34.30 36.29	0.28 ^F
Race White Coloured	25.50 30.57	0.12	14.00 15.95	0.80	32.50 35.16	0.38
Religion None Christianity Islam	24.67 29.75 32.94	0.002^F	16.00 15.98 15.65	0.91 ^F	34.33 34.70 36.06	0.51 ^F
Marital status Single Married/Cohabiting	30.53 30.00	0.74	15.69 16.47	0.32	35.22 34.60	0.62
Employment status Unemployed Employed	30.67 28.00	0.17	15.91 15.67	0.83	35.09 34.83	0.89
Highest Education Below Matric Matric and above	30.68 29.63	0.50	15.75 16.25	0.51	35.80 33.06	0.02

F= ANOVA (Analysis of Variance).

t-test was used to compare means except where indicated with F.

Table 17: Readiness for change and Methamphetamine use

Variables	Recognition		Ambivalence		Taking Steps	
	Mean Score	P value	Mean Score	P value	Mean Score	P value
Duration of use (years) ≤3 >3	29.13 30.60	0.59	15.25 15.98	0.46	36.38 34.87	0.34
Average weekly quantity (gram) < 1 ≥1	27.36 31.08	0.08	16.00 15.86	0.92	33.27 35.47	0.11
Pattern of use Twice a week or Weekends >Twice a week Daily	30.89 30.88 30.03	0.77 ^F	16.22 16.24 15.62	0.67 ^F	35.33 35.29 34.88	0.93 ^F

F= ANOVA

t-test was used to compare means except where indicated with F.

Table 18: Readiness for change and Methamphetamine Treatment/Abstinence

Variables	Recognition		Ambivalence		Taking Steps	
	Mean Score	P value	Mean Score	P value	Mean Score	P value
Current Treatment In-patient Rehab Out-patient Rehab	29.52 31.23	0.14	15.97 15.81	0.82	34.76 35.35	0.58
Treatment duration (weeks) < 1 1 - 4 > 4	27.00 31.11 30.16	0.11 ^F	16.67 16.23 15.00	0.19 ^F	35.83 34.77 35.37	0.79 ^F
Treatment reason Voluntary Compelled/Mandated	30.56 29.00	0.42	15.87 16.00	0.94	35.20 33.83	0.45
Past Treatment No Yes	30.02 31.44	0.21	16.14 15.19	0.21	34.66 36.19	0.21
Longest Voluntary abstinence(months) Never < 6 ≥ 6	27.00 30.53 30.79	0.29 ^F	17.25 15.59 16.04	0.46 ^F	34.00 36.22 33.71	0.07 ^F

F= ANOVA

t-test was used to compare means except where indicated with F.

Table 19: Readiness for change and Social Activities

Variables	Recognition		Ambivalence		Taking Steps	
	Mean Score	P value	Mean Score	P value	Mean Score	P value
Leisure activities Drug related Non Drug related	29.40 30.73	0.32	17.60 15.31	0.002	33.47 35.60	0.08
Leisure company Alone Family/Friends	30.82 30.31	0.73	16.64 15.71	0.29	36.27 34.80	0.29

F= ANOVA

t-test was used to compare means except where indicated with F.

Table 20: Readiness for change and Previous Psychiatric History

Variables	Recognition		Ambivalence		Taking Steps	
	Mean Score	P value	Mean Score	P value	Mean Score	P value
Family History No Yes	30.47 29.86	0.74	16.00 15.00	0.34	34.92 36.14	0.26
Personal History No Yes	31.02 27.64	0.02	15.84 16.09	0.77	34.84 36.09	0.20

F= ANOVA

t-test was used to compare means except where indicated with F.

5.7 CORRELATIONS

As shown in Tables 21 below, the quantity of methamphetamine used per week positively correlated with the SOCRATES' dimensions of 'Recognition' ($p=0.02$) and 'Taking Steps' ($p=0.003$). 'Taking Steps' correlated negatively with the duration of methamphetamine use ($p=0.02$) and the dimension of 'Ambivalence' ($p=0.0001$). Also, there was a negative correlation between 'Ambivalence' and duration of current drug treatment ($p=0.01$).

These findings suggest that the more the quantity of methamphetamine used, the greater the recognition of the problem. Also, longer duration of methamphetamine use was associated with increased ambivalence towards change. This ambivalence, however, reduces with longer stay in treatment.

Table 21: Significant Correlates of SOCTRATES dimensions

Test variables → ↓	Spearman's Correlation	SDS Score	Recogni- tion	Ambiva- lence	Taking Steps	Age	Duration of 'Tik' use	'Tik' Qty per week	Duration of current Rx
Recognition	Correlation Coefficient Sig. (2-tailed) N							0.313* 0.015 60	
Ambivalence	Correlation Coefficient Sig. (2-tailed) N				-0.602** 0.000 60				-0.339** 0.008 60
Taking Steps	Correlation Coefficient Sig. (2-tailed) N			-0.602** 0.000 60			-0.297* 0.021 60	0.374** 0.003 60	

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

SOCRATES dimensions include: Recognition, Ambivalence and Taking Steps.

CHAPTER SIX

DISCUSSION

6.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS

There were significantly more males than females in this study. This is in sharp contrast to the findings of Zweben et al (2004) who found more females than males in their American cohort of methamphetamine users in treatment programs. Although females may be particularly vulnerable to the reinforcing effects of stimulant drugs such as methamphetamine (Lynch, 2006), males have exhibited significantly higher rates of substance use, abuse and dependence in the United States (Compton, 2007). In Cape Town, women with Substance use disorder are more negatively perceived than their male counterparts (Myers et al, 2009). Previous research revealed that moral discourses around substance use and intoxication are particularly salient for women, compared to men; with female substance abuse generally associated with sexual availability and an inability to fulfil traditional gender roles (Myers et al, 2009). These representations may hinder treatment-seeking for women, as they may deny or hide their condition for fear of being labelled, for fear of having their children removed from their care, and for fear that treatment providers will be judgmental. Support for this explanation emerges from findings of negative perceptions towards women who use substances by health professionals and community-based organisations in South Africa (Sonja et al, 2008)

Similar to previously observed trends in treatment settings (SACENDU, 2010), the majority of respondents were below the age of 35 years, single, had secondary education without matriculating and were unemployed. Also, nearly all the

respondents were of the 'coloured' race. This finding is consistent with prior reports by twenty-two specialist treatment centres in Cape Town (SACENDU, 2010). The high proportion of 'coloured' people in this study may be partly explained by the high concentration of 'coloured' people in the Western Cape Province (Small, 2008). However, this group of people has a long history of social deprivation, unemployment, poverty, alcoholism, crime and gangsterism, which may in turn lead to substance use (Legget, 2004).

The characteristics of the sample in this study are a reflection of admission policies and the very specific populations served by the treatment centres that were used as sampling sites.

6.2 METHAMPHETAMINE USE, PATTERN AND ABSTINENCE

This study showed that teenagers are particularly vulnerable to using drugs. The majority of respondents had their first illicit drug use in their teenage years. Two-thirds reported cannabis as their first drug of abuse. Cannabis thus appears to be the illicit 'gateway drug' in Cape Town. Research has shown that it is the most common drug of abuse after tobacco and alcohol among high school students in Cape Town (Plüddemann et al, 2010). This might not be unrelated to the fact that South Africa is a large producer of cannabis, thus making it highly available and accessible (UNODC, 2009).

Glasner-Edwards et al (2010) had earlier reported the average frequency of methamphetamine use among individuals dependent on methamphetamine as 12 days per month. In the current study, only about half of the respondents used methamphetamine on a daily basis. It is not unusual to find individuals who use methamphetamine on weekends or a couple of days within a week as dependent on

methamphetamine. It may be that the 'binge and crash' pattern of use is common among this group of weekend users.

The pattern of methamphetamine use found in this study is characteristic of a sample drawn from treatment centres. The majority had used an average of one gram per week for more than three years. They equally lacked the capacity to abstain from using for up to six months.

6.3 PSYCHIATRIC COMORBIDITY

The prevalence of psychiatric morbidity amongst the study population was found to be 38.3%. This is higher than both the lifetime and 12-month prevalence of psychiatric disorders among the general population of South Africa. In a large-scale population-based study of common mental disorders in the South Africa, the lifetime prevalence of psychiatric disorders was found to be 30.3% while the 12-month prevalence was 16.5% (Herman et al, 2009; Williams et al, 2008).

The observed high rate of psychiatric disorders in the study population is consistent with the findings of a previous study (Glasner-Edwards et al, 2010). This suggests that psychiatric disorders are quite common among individuals dependent on Methamphetamine. Although the rate in the current study is slightly lower rate than the 48.1% prevalence rate reported by Glasner-Edwards et al (2010), differences in sample size, study population and diagnostic methods could have contributed to this discrepancy. Nonetheless, this rate still falls within the mid-range of estimated prevalence rates among individuals dependent on similar stimulants such as cocaine, which is between 21% and 73% (Rounsaville et al, 1991; Weiss et al, 1986).

6.3.1 PREVALENCE AND PATTERN OF PSYCHIATRIC DISORDERS

Prevalence rates were 18.3%, 13.3% and 6.7% for mood, psychotic and anxiety disorders respectively. Prior reports from clinical samples of methamphetamine users had equally shown that psychiatric co-morbidity was largely accounted for by mood disorders, psychotic disorders and anxiety disorders (Glasner-Edwards et al, 2010).

Mood disorders were the commonest psychiatric disorders in the current study. More than half of those with mood disorders had 'Bipolar disorder Not Otherwise Specified'. This was characterised by intermittent hypomanic episodes. Though it might be a rarely reported finding, methamphetamine use is known to cause hypomanic symptoms (Lee, 2007) significant enough to meet this diagnostic rubric. This is especially true when structured diagnostic instruments such as the SCID is utilised.

The substance induced mood disorders observed in this study were primarily substance induced depression. Out of the total study population, 3.3% had substance induced depression. This parallels the work of Salo et al (2010) which reported 10.6% prevalence of substance induced mood disorder (with depressive features) in a larger sample of methamphetamine dependent subjects. The use of methamphetamine can result in depressive symptoms not only in the aftermath of the use episode, but months thereafter (Zweben et al, 2004). It is not clear if these depressive symptoms are part of 'Methamphetamine Withdrawal Syndrome' or constitute an independent entity. Two previous studies (Zorick et al, 2010; McGregor et al, 2005) had reported acute (7-10days) and sub-acute (second and third weeks) depressive symptoms as central hallmark of the 'Methamphetamine Withdrawal

Syndrome'. Nonetheless, in a study of methamphetamine-dependent individuals entering psychosocial treatment, depressive symptoms declined during the course of treatment (Glasner-Edwards et al, 2009). Symptoms reduced among those who abstained from methamphetamine during treatment relative to those who used; abstainers shifted from clinically relevant symptom levels at baseline to the normal or minimal symptom range at discharge.

One out of every seven respondents in this study had a psychotic disorder. The observed 13.3% prevalence rate of psychotic disorders is consistent with the findings of a recent study (Glasner-Edwards et al, 2010) which reported psychotic disorders as common amongst individuals dependent on methamphetamine. In addition, in a study of inpatients admitted for substance dependence in Sweden, 31.5% of methamphetamine users met criteria for psychotic diagnosis (Dalmau et al, 1999). Psychosis represents a significant mental health problem in relation to methamphetamine use (Lee et al, 2007). In considering a mechanism by which elevated psychotic disorders in methamphetamine dependent populations may be explained, there is a need to separate substance-related from substance-independent underlying aetiologies of psychosis.

Half of the psychotic disorders, constituting 6.7% of the total psychiatric co-morbidity in this study were due to Paranoid Schizophrenia. This may be due to the fact that methamphetamine use not only triggers psychotic relapse in individuals with schizophrenia but can initiate onset of schizophrenic illness in predisposed individuals (Lee et al, 2007).

The prevalence of methamphetamine-induced psychoses in this study was 3.3% and these made up a quarter of all psychotic disorders. Similar to previous descriptions

(McKetin et al, 2006; Newton et al, 2004), they were 'Brief psychotic disorders which occurred transiently and subsided within a week of abstinence. Methamphetamine-induced psychosis has been associated with chronic high-dose use of methamphetamine, as well as the use of potent forms such as 'crystal meth' (Lee et al, 2007). Majority of the participants in the current study had used an average of one gram per week of 'crystal meth' for more than three years. Therefore, the observed low prevalence of this substance-induced psychosis in comparison to previous studies (Shoptaw et al, 2003; McKetin et al, 2006), may be due to differences in methodology and sample. The study by Shoptaw et al (2003), for example, was carried out among gay and bisexual men while McKetin et al (2006) made psychiatric diagnoses using the Brief Psychiatric Rating scale.

Anxiety is one of the common psychiatric symptoms reported among methamphetamine users (Glasner-Edwards et al, 2010b; Zweben et al, 2004). In the current study, the prevalence of anxiety disorders was 6.7%; no substance-induced anxiety disorder was found. Two previous studies (Salo et al, 2010; Shoptaw et al, 2003), had inferred that anxiety disorders tend to be independent disorders rather than substance-induced among methamphetamine users. Rates of substance-induced anxiety disorders were lower compared to that of primary anxiety disorders in the two studies. In addition, the modest sample size of this current study possibly contributed to the absence of substance-induced anxiety disorders in the study.

6.3.2 RISK FACTORS FOR PSYCHIATRIC COMORBIDITY

Risk factors for psychiatric co-morbidity identified in this study include being male, younger age and previous psychiatric history. Different researchers had reported divergent findings on the association between gender and psychiatric co-morbidity

among substance-using population. Katz et al (2008) reported that dual-diagnosis patients were often males. On the other hand, a study of psychiatric morbidity and gender differences among methamphetamine users found that women commonly experienced mental health disturbances than their male counterparts (Lin et al, 2004). Important methodological differences such as sample size and study setting may be responsible for the reported findings of the latter and this current study. For example, the latter was conducted in a forensic setting.

An inversely proportional relationship was found between age and psychiatric co-morbidity; younger individuals had an increased risk of psychiatric co-morbidity. A similar observation was noted by Katz et al (2008). This possibly reflects the vulnerability of the younger person; effects on developmental processes and plasticity of the young brain to the effects of drugs. In this study, more than 80% of the respondents were younger than 35 years of age, had their first drug use as teenagers and had used methamphetamine for more than 3 years. These may have contributed to the observed high prevalence of psychiatric co-morbidity.

Previous psychiatric history was found to be independently associated with psychiatric co-morbidity among individuals dependent on methamphetamine. This is consistent with a previous report (Lee et al, 2007). The use of methamphetamine may not only induce new psychiatric disorders but exacerbate pre-existing disorders. Therefore, individuals with previous psychiatric history are particularly vulnerable to further mental health disturbances when they use methamphetamine. Also, it is plausible that psychiatrically ill individuals are vulnerable to methamphetamine use as a result of poor judgement.

6.4 READINESS FOR CHANGE

Sixty-percent of the respondents were at the stage of 'Taking steps'. This proportion of motivated individuals is consistent with what would have been expected for a sample of individuals drawn from treatment centres at various stages of therapy.

6.4.1 READINESS FOR CHANGE AND PSYCHIATRIC COMORBIDITY

Few studies had examined the relationship between readiness for change and psychiatric co-morbidity among substance dependent cohorts. Carosella et al (1999) reported that psychiatric co-morbidity negatively impacts on readiness for change among individuals dependent on nicotine. On the other hand, a critical review of the literature by Heffner et al (2007) showed that psychiatric co-morbidity is not a consistent predictor of readiness for change.

In this study, psychiatric co-morbidity showed no association with readiness for change other than *Recognition* of the drug problem. Respondents with current psychiatric co-morbidity had significant lower scores on the SOCRATES' dimension of 'Recognition' compared to those without psychiatric co-morbidity ($p = 0.01$). This significant reduction in the recognition of the drug problem might be due to intra-psychic experiences or impaired judgement associated with psychiatric disorders. It does appear that beyond this stage of recognition, psychiatric co-morbidity had no significant associations with the other stages of readiness for change.

As instructive as this may be for treatment planning, the finding should be considered in the context of the limitations of this study. First, the respondents were volunteers; they could have been predisposed to change. Second, a modest sample size of 60 may fail to show significant association of this nature. Third, the admission

policies of the participating treatment centres precluded individuals with florid psychiatric symptoms. Therefore, volunteers with co-morbid psychiatric disorders had their symptoms in remission.

6.4.2 FACTORS ASSOCIATED WITH READINESS FOR CHANGE

Recognition:

Recognition of the drug problem was found to correlate positively with quantity of methamphetamine used per week. This suggests that users of large quantity of methamphetamine per week were more likely to recognize the severity of their drug problem and the consequent need to do something about that problem. This shares some similarities with the findings of a previous study in which recognition was found to be positively related to frequency of heroin use (Gossop et al, (2007).

Other important associations with the recognition stage of readiness for change found in this study include: gender, religious affiliation and previous psychiatric history.

Females had significantly higher scores on *Recognition* compared to their male counterparts ($p = 0.04$). This implies that females are more aware of problems related to their methamphetamine addiction. The observed association of gender with *Recognition* is at variance with the findings of a multi-centre study of drug users in Malaysia (Fauziah et al, 2011). The latter reported no difference between the genders with respect to *Recognition*. However, considering earlier reported barriers to alcohol and drug treatment for women in Cape Town (Myers et al, 2011; Myers et al, 2009), it may be that females who eventually make it to drug rehabilitation centres in this environment truly acknowledge problems related to their drug use. Not only

that, the better recognition of methamphetamine problems by females observed in this study may be because more males had psychiatric co-morbidity which impacted negatively on *Recognition*.

Affiliation to a religious group was also observed to be significantly associated with recognition of drug-related problems. Respondents with no religious affiliation scored lower on recognition in comparison with those that have religious affiliation; be it Christianity or Islam ($p = 0.02$). Although religious and spiritual beliefs were found to be associated with better treatment outcome among a group of drug users in the United States (Heinz et al, 2007), little is known about the relationship between religious affiliation and stages of change. It is probable that religion facilitates conscious awareness of drug related problems by creating cognitive dissonance in the individual.

Similar to the relationship between current psychiatric morbidity and the Recognition stage mentioned above, previous psychiatric history equally had a negative impact on ability to recognise methamphetamine-related problems. Respondents with previous psychiatric history had significantly lower recognition score ($p = 0.02$).

Ambivalence:

Factors found to be related to Ambivalence include treatment duration and leisure activities. A significant negative correlation was observed between treatment duration and ambivalence. This shows that with longer treatment duration, the level of doubt to change reduces. Similarly, previous studies have reported better treatment outcome of addiction disorder with longer duration of treatment (Hubbard et al, 1997). Therefore, this particular finding might be relevant for treatment planning.

The nature of leisure activities had significant association with Ambivalence. Respondents with drug-related leisure activities scored higher on ambivalence compared to those involved in non-drug related leisure activities ($p = 0.02$). Such an observation implies that having alternative non-drug related leisure activities reduces ambivalence towards change. This is a logical and common sense relationship that is being confirmed by this study. It does mean that contextual factors such as leisure time activities contribute to readiness for change. This finding may be of prognostic importance in the treatment of methamphetamine dependence.

Taking steps:

The duration of methamphetamine use seems to affect the ability to take steps towards overcoming the addiction. This is reflected in the significant negative correlation between duration of methamphetamine use and *Taking steps* observed in this study. Putting this observation into consideration while planning treatment of methamphetamine users may improve therapeutic outcome.

At the stage of *Taking steps*, educational level did appear to be influential. Interestingly, respondents with lower education level (below matric) had significantly higher scores in *Taking Steps* compared to more educated ones. Amongst a large sample of smokers, Velicer and colleagues (1995) discovered that education level was negatively associated with stages of change. As the level of education increased, they were less likely to stop smoking (Velicer et al, 1995). Nonetheless, this finding should be interpreted with due consideration to limitations of the current study and the disproportionately high number of respondents with below matric education.

CHAPTER SEVEN

LIMITATIONS AND STRENGTH

7.1 LIMITATIONS:

- i. The sample being one drawn from treatment centres limits the extent of generalisation of findings to the population of methamphetamine dependent individuals within the community.
- ii. The relatively limited sample size and non-random selection of participants.
- iii. The effects of educational level on participants' responses to the self-administered instruments cannot be ruled out. More than half of the participants did not complete secondary education.
- iv. The study did not report on the relationship between each category of psychiatric disorder and readiness for change. Each psychiatric disorder may impact differently on readiness for change.

7.2 STRENGTH:

- i. The diagnoses of psychiatric disorders were made using a structured diagnostic instrument.
- ii. This study elucidated the patterns of psychiatric co-morbidity among the study population. Independent psychiatric disorders were separated from substance induced disorders.
- iii. Pertinent findings from this study may add to the body of literature in the field of addiction psychiatry from Africa. This may be a basis for further studies.

Despite its limitations, this study has policy implications that merit further research.

CHAPTER EIGHT

CONCLUSION

Methamphetamine abuse is a major problem among the 'coloured' population of Cape Town. Most of the respondents had their first drug use as teenagers. They left school before the matriculation class and were mostly unemployed. Those dependent on methamphetamine experience psychiatric disorders more than the general population.

In this study, the prevalence of psychiatric co-morbidity was 38.3%. This high prevalence rate is a reflection of the vulnerability of these individuals to psychiatric disorders, either from exacerbation of pre-existing disorder or induction of new ones. Mood disorders were the most frequent, followed by psychotic and anxiety disorders. Bipolar disorder Not Otherwise Specified (intermittent hypomanic episodes) was the commonest mood disorder. Among those with psychotic disorders, Paranoid schizophrenia was the commonest. The male gender and previous psychiatric history were risk factors for current psychiatric co-morbidity. Also, younger methamphetamine users had higher risks of psychiatric co-morbidity.

Current psychiatric co-morbidity and previous psychiatric history adversely affected recognition of the drug problem. Beyond the stage of recognition, no relationship was found between psychiatric co-morbidity and readiness for change among individuals dependent on methamphetamine.

Females were more aware of problems related to their methamphetamine addiction. Also, individuals with religious beliefs or affiliation recognised drug problems better. The level of doubt about change reduced with increased duration of treatment.

Having alternative non-drug related leisure activities equally reduced ambivalence to change.

Lastly, the longer the duration of methamphetamine use, the more difficult it is to take steps towards commitment for change.

University of Cape Town

CHAPTER NINE

RECOMMENDATIONS

To reduce the scourge of methamphetamine addiction and its mental health consequences in Cape Town, primary prevention strategies should target teenagers. Broad-based school-based drug policies should be actively developed and promoted.

In the light of the observed high prevalence of psychiatric disorders among individuals dependent on methamphetamine, there is a need to train drug counsellors to be more adept at identifying mental health symptoms. Those with co-morbid psychiatric disorders may not necessarily be excluded from motivational therapy sessions. Rather an integrated model of care addressing both substance use disorders and psychiatric co-morbidity should be instituted in drug rehabilitation. This would mean a review of the current admission policy into rehabilitation centres and employment of psychiatry personnel in these centres to facilitate integrated care.

Furthermore, as an important component of effective treatment planning, counsellors might find it helpful to identify the duration of drug use and the stage of change which characterise each patient. Based on these, individualised strategies or programmes to enhance readiness for change among patients could be recommended.

Also, life skills training should focus on substitution of leisure time with non-drug related activities. This would reduce the ambivalence towards change, bolster readiness for change and eventual treatment outcome

Lastly, there is a need for more studies on readiness for change and mental health of individuals dependent on methamphetamine in Western Cape. Such studies should be of larger sample size and preferably longitudinal.

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APPENDICES

PARTICIPANTS' INFORMATION SHEET AND CONSENT FORM

Title of the Research:

Psychiatric Morbidity and Readiness for change: A study of Methamphetamine dependent subjects in Cape Town.

Dear Participant

You are being invited to take part in a research project. Please take some time to read the information presented below, which will explain the details of this project. You can ask the doctor questions about any part of this project that you do not fully understand.

What is the study about?

The study is aimed at evaluating psychiatric disorders and readiness for change among individuals using Methamphetamine in Cape Town.

What is expected of you if you agree to participate?

You will be expected to provide answers to questions like your age, marital status, religion, employment status, drug habits and attempts at rehabilitation. Questionnaires assessing your level of motivation and severity of addiction would be administered. You will equally benefit from a structured psychiatric interview.

Confidentiality:

The information collected from you will be treated in absolute confidence. No part or whole of such information shall be divulged to anybody except the investigators.

Your Participation is entirely voluntary:

Your participation in this study is voluntary. You may withdraw at any time of the study if you so wish. Refusal to participate will not affect you negatively in any way whatsoever.

INFORMED CONSENT FORM

In order to participate in this research study, it is necessary that you give your informed consent.

By signing this informed consent form you are indicating that you understand the nature of the research study and that you agree to participate in the research. Please consider the following points before signing:

- I understand that I am participating in a research;
- All the terms of this consent have been explained to me in a language that I understand;
- I am aware that the study to be carried out would not harm me in anyway;
- I have been assured that the information on me shall be kept in strict confidence;
- I understand that my participation in this research is voluntary, and that I may refuse to participate further at any time without having to offer an explanation.

By signing this form I am stating that I am 18 years of age or older, and that I understand the above information and consent to participate in this study.

.....

Name of participant

.....

Name of researcher

.....

Signature of participant/Date

.....

Signature of researcher/Date

Table A1: Recognition and Socio-demographic Characteristics

Variables	Recognition			
	Mean Score	Test	df	P value
Gender Male Female	29.79 31.94	t (2.10)	47.53	0.04
Age (years) <25 25-34 >35	31.90 29.33 31.14	F (2.27)	2	0.11
Race White Coloured	25.50 30.57	t (-1.60)	58.00	0.12
Religion None Christianity Islam	24.67 29.75 32.94	F (6.78)	2	0.002
Marital status Single Married/Cohabiting	30.53 30.00	t (0.33)	18.69	0.74
Employment status Unemployed Employed	30.67 28.00	t (1.40)	58	0.17
Highest Education Below Matric Matric and above	30.68 29.63	t (0.69)	20.60	0.50

F= ANOVA (Analysis of Variance).

t = t-test.

df = degree of freedom

Table A2: Recognition and Methamphetamine use

Variables	Recognition			
	Mean Score	Test	df	P value
Duration of use (years) ≤ 3 > 3	29.13 30.60	t (-0.56)	7.63	0.59
Average weekly quantity (gram) < 1 ≥ 1	27.36 31.08	t (-1.926)	11.71	0.08
Pattern of use Twice a week or Weekends $>$ Twice a week Daily	30.89 30.88 30.03	F (0.26)	2	0.77

F= ANOVA (Analysis of Variance).

t = t-test.

df = degree of freedom

Table A3: Recognition and Methamphetamine Treatment/Abstinence

Variables	Recognition			
	Mean Score	Test	df	P value
Current Treatment In-patient Rehab Out-patient Rehab	29.52 31.23	t (-1.48)	51.33	0.14
Treatment duration (weeks) < 1 1 - 4 > 4	27.00 31.11 30.16	F (2.32)	2	0.11
Treatment reason Voluntary Compelled/Mandated	30.56 29.00	t (0.81)	58	0.42
Past Treatment No Yes	30.02 31.44	t (-1.27)	37.33	0.21
Longest Voluntary abstinence(months) Never < 6 ≥ 6	27.00 30.53 30.79	F (1.28)	2	0.29

F= ANOVA (Analysis of Variance).

t = t-test.

df = degree of freedom

Table A4: Recognition and Social Activities

Variables	Recognition			
	Mean Score	Test	df	P value
Leisure activities Drug related Non Drug related	29.40 30.73	t (-1.00)	58	0.32
Leisure company Alone Family/Friends	30.82 30.31	t (0.34)	58	0.73

t = t-test.

df = degree of freedom

Table A5: Recognition and Previous Psychiatric History

Variables	Recognition			
	Mean Score	Test	df	P value
Family History No Yes	30.47 29.86	t (0.34)	58	0.74
Personal History No Yes	31.02 27.64	t (2.36)	58	0.02

t = t-test.

df = degree of freedom

Table B1: Ambivalence and Socio-demographic Characteristics

Variables	Ambivalence			
	Mean Score	Test	df	P value
Gender Male Female	16.00 15.59	t (-0.55)	58	0.58
Age (years) <25 25-34 >35	16.10 15.82 15.88	F (0.13)	2	0.88
Race White Coloured	14.00 15.95	t (-0.32)	1.01	0.80
Religion None Christianity Islam	16.00 15.98 15.65	F (0.10)	2	0.91
Marital status Single Married/Cohabiting	15.69 16.47	t (-1.00)	58	0.32
Employment status Unemployed Employed	15.91 15.67	t (0.21)	58	0.83
Highest Education Below Matric Matric and above	15.75 16.25	t (-0.66)	58	0.51

F= ANOVA (Analysis of Variance).

t = t-test.

df = degree of freedom

Table B2: Ambivalence and Methamphetamine use

Variables	Ambivalence			
	Mean Score	Test	df	P value
Duration of use (years) ≤ 3 > 3	15.25 15.98	t (-0.74)	58	0.46
Average weekly quantity (gram) < 1 ≥ 1	16.00 15.86	t (0.11)	11.18	0.92
Pattern of use Twice a week or Weekends $>$ Twice a week Daily	16.22 16.24 15.62	F (0.40)	2	0.67

F= ANOVA (Analysis of Variance).

t = t-test.

df = degree of freedom

Table B3: Ambivalence and Methamphetamine Treatment/Abstinence

Variables	Ambivalence			
	Mean Score	Test	df	P value
Current Treatment In-patient Rehab Out-patient Rehab	15.97 15.81	t (0.23)	50.10	0.82
Treatment duration (weeks) < 1 1 - 4 > 4	16.67 16.23 15.00	F (1.72)	2	0.19
Treatment reason Voluntary Compelled/Mandated	15.87 16.00	t (-0.08)	5.39	0.94
Past Treatment No Yes	16.14 15.19	t (1.26)	58	0.21
Longest Voluntary abstinence(months) Never < 6 ≥ 6	17.25 15.59 16.04	F (0.79)	2	0.46

F= ANOVA (Analysis of Variance).

t = t-test.

df = degree of freedom

Table B4: Ambivalence and Social Activities

Variables	Ambivalence			
	Mean Score	Test	df	P value
Leisure activities Drug related Non Drug related	17.60 15.31	t (3.17)	58	0.002
Leisure company Alone Family/Friends	16.64 15.71	t (1.07)	58	0.29

t = t-test.

df = degree of freedom

Table B5: Ambivalence and Previous Psychiatric History

Variables	Ambivalence			
	Mean Score	Test	df	P value
Family History No Yes	16.00 15.00	t (0.96)	58	0.34
Personal History No Yes	15.84 16.09	t (-0.29)	58	0.77

t = t-test.

df = degree of freedom

Table C1: Taking steps and Socio-demographic Characteristics

Variables	Taking Steps			
	Mean Score	Test	df	P value
Gender Male Female	35.02 35.18	t (0.13)	58	0.90
Age (years) <25 25-34 >35	35.90 34.30 36.29	F (1.29)	2	0.28
Race White Coloured	32.50 35.16	t (-0.89)	58	0.38
Religion None Christianity Islam	34.33 34.70 36.06	F (0.69)	2	0.51
Marital status Single Married/Cohabiting	35.22 34.60	t (0.50)	58	0.62
Employment status Unemployed Employed	35.09 34.83	t (0.15)	58	0.89
Highest Education Below Matric Matric and above	35.80 33.06	t (2.35)	58	0.02

F= ANOVA (Analysis of Variance).

t = t-test.

df = degree of freedom

Table C2: Taking steps and Methamphetamine use

Variables	Taking Steps			
	Mean Score	Test	df	P value
Duration of use (years) ≤ 3 > 3	36.38 34.87	t (0.96)	58	0.34
Average weekly quantity (gram) < 1 ≥ 1	33.27 35.47	t (-1.62)	58	0.11
Pattern of use Twice a week or Weekends $>$ Twice a week Daily	35.33 35.29 34.88	F (0.08)	2	0.93

F= ANOVA (Analysis of Variance).

t = t-test.

df = degree of freedom

Table C3: Taking steps and Methamphetamine Treatment/Abstinence

Variables	Taking Steps			
	Mean Score	Test	df	P value
Current Treatment In-patient Rehab Out-patient Rehab	34.76 35.35	t (-0.56)	58	0.58
Treatment duration (weeks) < 1 1 - 4 > 4	35.83 34.77 35.37	F (0.24)	2	0.79
Treatment reason Voluntary Compelled/Mandated	35.20 33.83	t (0.77)	58	0.45
Past Treatment No Yes	34.66 36.19	t (-1.28)	58	0.21
Longest Voluntary abstinence(months) Never < 6 ≥ 6	34.00 36.22 33.71	F (2.85)	2	0.07

F= ANOVA (Analysis of Variance).

t = t-test.

df = degree of freedom

Table C4: Taking steps and Social Activities

Variables	Taking Steps			
	Mean Score	Test	df	P value
Leisure activities Drug related Non Drug related	33.47 35.60	t (-1.76)	58	0.08
Leisure company Alone Family/Friends	36.27 34.80	t (1.07)	58	0.29

t = t-test.

df = degree of freedom

Table C5: Taking steps and Previous Psychiatric History

Variables	Taking Steps			
	Mean Score	Test	df	P value
Family History No Yes	34.92 36.14	t (-1.17)	12.75	0.26
Personal History No Yes	34.84 36.09	t (-1.32)	28.54	0.20

t = t-test.

df = degree of freedom

Table D: Correlations

Test variables → ↓	Spearman's Correlation	SDS Score	Recogni- tion	Ambiva- lence	Taking Steps	Age	Duration of 'Tik' use	'Tik' Qty per week	Duration of current Rx
SDS Score	Correlation Coefficient Sig. (2-tailed) N	1.000 . 60	-0.016 0.902 60	0.094 0.474 60	-0.127 0.333 60	-0.066 0.618 60	-0.052 0.694 60	0.058 0.659 60	-0.010 0.939 60
Recognition	Correlation Coefficient Sig. (2-tailed) N	-0.016 0.902 60	1.000 . 60	0.055 0.679 60	0.195 0.135 60	-0.091 0.487 60	0.045 0.730 60	0.313* 0.015 60	0.042 0.752 60
Ambivalence	Correlation Coefficient Sig. (2-tailed) N	0.094 0.474 60	0.055 0.679 60	1.000 . 60	-0.602** 0.000 60	-0.119 0.364 60	0.092 0.486 60	-0.086 0.512 60	-0.339** 0.008 60
Taking Steps	Correlation Coefficient Sig. (2-tailed) N	-0.127 0.333 60	0.195 0.135 60	-0.602** 0.000 60	1.000 . 60	-0.056 0.672 60	-0.297* 0.021 60	0.374** 0.003 60	0.166 0.206 60
Age	Correlation Coefficient Sig. (2-tailed) N	-0.066 0.618 60	-0.091 0.487 60	-0.119 0.364 60	-0.056 0.672 60	1.000 . 60	0.040 0.762 60	0.088 0.505 60	-0.012 0.925 60
Duration of 'Tik' use	Correlation Coefficient Sig. (2-tailed) N	-0.052 0.694 60	0.045 0.730 60	0.092 0.486 60	-0.297* 0.021 60	0.040 0.762 60	1.000 . 60	0.111 0.400 60	0.062 0.640 60
'Tik' Quantity (Qty) per week	Correlation Coefficient Sig. (2-tailed) N	0.058 0.659 60	0.313* 0.015 60	-0.086 0.512 60	0.374** 0.003 60	0.088 0.505 60	0.111 0.400 60	1.000 . 60	0.018 0.891 60
Duration of current Drug Treatment (Rx)	Correlation Coefficient Sig. (2-tailed) N	-0.010 0.939 60	0.042 0.752 60	-0.339** 0.008 60	0.166 0.206 60	-0.012 0.925 60	0.062 0.640 60	0.018 0.891 60	1.000 . 60

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Socio-demographic Questionnaire

Study ID: -----

Section A:

1. Gender : Male

Female

2. Age :

3. Race : i. Black

ii. White

iii. Coloured

iv. Asians

others (specify).....

4. Religion.....

Would you describe yourself as a religious person? Yes..... No.....

5. Marital status: i. Single

ii. Married

iii. Co-habiting

iv. Widowed

v. Divorced

vi. Separated

6. Do you have children? Yes

No

If Yes, how many?

7. Where do you live?

8. What term best describes the kind of neighbourhood in which you live?

i. Suburban

ii. Urban

iii. Township

iv. Intermediate

9. Who lives with you at home? (e.g Friend, Step-father, mother,etc).....

10. What is your highest level of education (highest grade completed)?.....

11. Employment status: i. Employed
ii. Unemployed
iii. Student
iv. Others (specify)

If employed, what kind of job do you do?

12. Monthly income

Section B:

13. What was your first drug of abuse (apart from Alcohol and Tobacco)?
Name the first 2 drugs in order of usage (i.....
(ii.....

14. How old were you when you first used drug?

15. How long have you been using 'Tik' ?

16. How much do you spend on 'Tik' on a weekly basis?

17a. What quantity of 'Tik' do you use on a weekly basis? (i.e. 'straws', grams, 'packs')

17b. How often do you use 'Tik' per week? (i.e. number of days per week)
.....

18. Type of current 'Tik' treatment: i. In-patient Rehab
ii. Out-patient Rehab

19. Reason for current 'Tik' treatment: i. Voluntary
ii. Mandated / Compulsory (e.g. by court)

20. How long have you been in this current treatment? -----

21. Have you had any previous treatment for 'Tik' abuse? Yes..... No.....

If Yes, which type:

i. In-patient Rehab

ii. Out-patient Rehab

iii. Both in-patient and out-patient Rehab

22. How many attempts at rehabilitation have you had in the past?

23. What was your longest period of abstinence from 'Tik' as a consequence of treatment?.....

24. What was your longest period of voluntary abstinence from 'Tik' (not as a consequence of treatment)?

Section C:

25. Have you ever been diagnosed to have a psychiatric illness in the past?

Yes.....

No.....

If Yes, when was the first time you had a psychiatric illness? (Specify month and year)

26. Has anyone in your family had a psychiatric illness not related to drug abuse?

Yes.....

No.....

If Yes, who? (e.g. Father, Brother, Aunt, Cousin, etc)

Section D:

27. How have you been spending your free time?

28. With whom do you spend most of your free time: i. Family

ii. Friends

iii. Alone

Severity of Dependence Scale (SDS)

In the past twelve months:

1. Did you ever think your Tik use was out of control?

<i>Never or almost never</i>	<i>0</i>
<i>Sometimes</i>	<i>1</i>
<i>Often</i>	<i>2</i>
<i>Always or nearly always</i>	<i>3</i>

2. Did the prospect of missing a smoke of Tik make you very anxious or worried?

<i>Never or almost never</i>	<i>0</i>
<i>Sometimes</i>	<i>1</i>
<i>Often</i>	<i>2</i>
<i>Always or nearly always</i>	<i>3</i>

3. Did you worry about your Tik use?

<i>Not at all</i>	<i>0</i>
<i>A little</i>	<i>1</i>
<i>Quite a lot</i>	<i>2</i>
<i>A great deal</i>	<i>3</i>

4. Did you wish you could stop?

<i>Never or almost never</i>	<i>0</i>
<i>Sometimes</i>	<i>1</i>
<i>Often</i>	<i>2</i>
<i>Always or nearly always</i>	<i>3</i>

5. How difficult would you find it to stop or go without Tik ?

<i>Not very difficult</i>	<i>0</i>
<i>Quite difficult</i>	<i>1</i>
<i>Very difficult</i>	<i>2</i>
<i>Impossible</i>	<i>3</i>